

### **REMARKS**

In response to the Office Action mailed February 22, 2006, Applicants respectfully request reconsideration. Claims 1-7 are pending for examination with claim 1, 6 and 7 being independent claims. No claims have been added, amended or canceled. No new matter has been added.

#### **Rejections Under 35 U.S.C. §103**

The Office Action rejected claims 1-7 under 35 U.S.C. §103(a) as being unpatentable over Ferrari et al. (U.S. Patent Application Publication No. US 2002/0011653) in view of Smoak (U.S. Patent No. 6,593,222). Applicants respectfully traverse these rejections. Applicants respectfully disagree that there exists motivation to combine Ferrari et al. and Smoak et al. However, the motivation to combine the references will not be discussed further herein because the claims distinguish over the combination.

#### **1. Discussion of Cited References**

Ferrari et al. describes an integrated inductor and a production method thereof (Title). A coil of metal 21b is formed in a metallization level of an integrated circuit. As illustrated in FIGS. 7 and 9, of Ferrari et al., reference character 21a designates the center of metal coil 21b. Contrary to the assertion in the Office Action, reference character 21a is not a contact pad for the soldering a wire bond, but rather a metal region that extends down into aperture 35 to make contact with connection line 16B (FIG. 7 and [0019]. Connection line 16B extends underneath coil 21b to provide an electrical connection from another portion of the integrated circuit (not shown) to the center 21a of the coil via aperture 35. Ferrari states that the contact pads are not shown in the figures [0020].

Smoak describes improving the reliability of wire bonds (Abstract). Aluminum interconnect line 2 provides electrical connections to devices in an integrated circuit. Tungsten vias 6 and titanium layer 8 are formed above interconnect line 2, and provide an electrical connection to aluminum pad 10, which is formed above tungsten vias 6. Thus, aluminum pad 10 is a contact pad that is formed in a different layer than interconnect line 2, above the electrical interconnects of the

integrated circuit (FIG. 1 and Col. 2, lines 55-63). The aluminum pad 10 is slightly etched to remove corrosive contaminants (Col. 4, lines 32-33).

2. Discussion of the Combination Proposed in the Office Action

The Office Action states:

It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to use the method of forming the contact pad of Smoak with Ferrari's teaching. One would have been motivated to so modify Ferrari to avoid Kirkendall voiding in the wire, a condition that the thin aluminum layer of the contact pad helps prevent. (Page 4 of the Office Action)

The Office Action appears to propose modifying the contact pads of Ferrari to be the contact pads of Smoak. As discussed above, the contact pads of Ferrari are not indicated by reference character 21a, but are simply not shown in Ferrari [0020]. If the Ferrari contact pad (not shown) were to be replaced with the contact pad of Smoak, then aluminum pad 10 of Smoak would be formed in the Ferrari circuit above the signal-carrying metal layer 2, as described in Smoak (FIG. 1 and Col. 2, lines 55-63). Thus, the aluminum pad 10 of Smoak would be formed in a different metallization level above the level of coil 21b used for carrying signals.

3. The Claims Distinguish over the Combination

As discussed above, the combination suggested in the Office Action would result in a contact pad formed in a different metallization level above the level of coil 21b used for carrying signals.

By contrast, claim 1 recites:

An integrated circuit comprising one or several metallization levels, **metal conductive strips and metal contact pads being formed on a last metallization level**, the last level being covered with a passivation layer in which are formed openings above the contact pads, wherein a thickness of the pads, at least at a level of their portions not covered by the passivation layer, is smaller than the thickness of said conductive strips.

Claim 1 patentably distinguishes over the combination of Ferrari and Smoak because the combination proposed in the Office Action does not include metal conductive strips and metal contact pads being formed on a last metallization level. Rather, as discussed above, coil 21b of Ferrari would be formed in a different metallization layer below the contact pad 10 of Smoak. Therefore, claim 1 patentably distinguishes over the combination of Ferrari and Smoak. Accordingly, withdrawal of this rejection is respectfully requested.

Claims 2-5 depend from claim 1 and are therefore patentable for at least the same reasons.

Claim 6 recites:

A method for forming the last metallization level of the integrated circuit of claim 1, comprising:  
depositing a metal layer on a substrate;  
**etching the metal layer to form metal portions and said conductive strips;**  
covering the substrate, the conductive strips, and the metal portions with a passivation layer;  
forming openings in the passivation layer above the metal portions; and  
**partially etching the metal portions to decrease their thickness to obtain said contact pads.**

Claim 6 patentably distinguishes over the combination of Ferrari and Smoak because the combination proposed in the Office Action does not include etching the metal layer to form metal portions and said conductive strips and partially etching the metal portions to decrease their thickness to obtain said contact pads. Rather, as discussed above, coil 21b of Ferrari would be formed in a different metallization layer below the contact pad 10 of Smoak, not formed from the same metal layer. Therefore, claim 6 patentably distinguishes over the combination of Ferrari and Smoak. Accordingly, withdrawal of this rejection is respectfully requested.

Claim 7 recites:

A method for forming the last metallization level of the integrated circuit of claim 1, comprising:  
depositing a metal layer on a substrate;  
**etching the metal layer to form metal portions and said conductive strips;**  
covering the conductive strips with a protection layer;  
**partially etching the metal portions to decrease their thickness to obtain said**

**contact pads;**

removing, if necessary, the protection layer;  
covering the substrate, the conductive strips, and the contact pads with a passivation layer; and  
forming openings in the passivation layer above the contact pads.

Claim 7 patentably distinguishes over the combination of Ferrari and Smoak because the combination proposed in the Office Action does not include etching the metal layer to form metal portions and said conductive strips and partially etching the metal portions to decrease their thickness to obtain said contact pads. Rather, as discussed above, coil 21b of Ferrari would be formed in a different metallization layer below the contact pad 10 of Smoak, not formed from the same metal layer. Therefore, claim 6 patentably distinguishes over the combination of Ferrari and Smoak. Accordingly, withdrawal of this rejection is respectfully requested.

**CONCLUSION**

A Notice of Allowance is respectfully requested. The Examiner is requested to call the undersigned at the telephone number listed below if this communication does not place the case in condition for allowance.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, applicant hereby requests any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to deposit account no. 23/2825.

Dated: July 21, 2006

Respectfully submitted,

By 

James H. Morris

Registration No.: 34,681

WOLF, GREENFIELD & SACKS, P.C.

Federal Reserve Plaza

600 Atlantic Avenue

Boston, Massachusetts 02210-2206

(617) 646-8000

### **AMENDMENTS TO THE DRAWINGS**

The Office Action objected to FIGS. 1-3 because FIGS. 1-3 did not include the legend "Prior Art." FIGS. 1, 2 and 3 have been amended to include the legend –Prior Art–, as requested in the Office Action. A "Replacement Sheet" is attached which includes a clean version of amended FIGS. 1, 2 and 3. The attached sheet replaces the original sheet including FIGS. 1, 2 and 3. Accordingly, withdrawal of this objection is respectfully requested.

The Office Action objected to the drawings because the reference characters "140, FIG. 8E" and "190, FIG. 8E" have both been used to designate an opening. FIG. 8E has been amended to change reference character "140" to "190." A "Replacement Sheet" is attached which includes a clean version of amended FIG. 8E. Accordingly, withdrawal of this rejection is respectfully requested.